REMARKS

In the Office Action dated June 6, 2005 which was made **FINAL**, Claims 1-17 were rejected. In the proposed amendment set forth above, Claims 1, 4 and 10 are amended to correct formality issues only, and the remaining Claims remain unchanged. It is respectfully requested that the amendments to the Claims set forth above be entered. In view of these amendments to the Claims, and the comments set fourth below, it is respectfully submitted that all Claims are now in condition for allowance, and a Notice of Allowance is therefore respectfully requested. If this rejection is maintained, it is respectfully requested that the formality amendments set forth above be entered for purposes of appeal.

1. Claims 4-9, and 10-17 were rejected under 35 USC §112 second paragraph as being indefinite for failing to particularly point out and distinctly Claim the subject matter of Applicants' invention. In particular, Claims 4 and 10 recite the limitation wherein the spreadsheet program and drawing program are both described as "independently operable". This is said to be indefinite. These limitations have been deleted from both Claims 4 and 10. Instead, each of the spreadsheet and drawing programs are each described as being "capable of executing apart from one another". This language clearly sets forth this aspect of Applicants' invention. With these changes, it is believed Claims 4-9 and 10-17 satisfy the requirements of 35 USC §112, and it is respectfully requested that this rejection be withdrawn.

2. Claims 1 and 11-15 were rejected under 35 USC §103(a) as being unpatentable over U.S. Patent No. 5,790,435 to Lewis et al. ("Lewis") in view of *Customizing Visio 2000 Software White Paper,* Microsoft Corporation, http://www.microsoft.com/technet/prodtechnol/visio/visio2000/maintain/custom.mspx ("Visio2000")

Several important distinctions exist between the system of Lewis and that of Applicants' Claims. While these distinctions were mentioned in Applicants' last

response dated 1/4/2005 ("Prior Response"), it may be beneficial to discuss these distinctions in somewhat more detail herein by citing passages from Lewis, as follows.

Lewis provides an automated mechanism for analyzing timing diagrams and verifying that timing relationships specified for a circuit are met. (Lewis column 2 lines 59-62.) This mechanism requires that a user first enter a timing diagram into the Diagram Window 36 (Figure 3) using a drawing program and a point-and-click device such as a mouse. This is discussed in Lewis as follows:

> "Signal waveforms 42 are *drawn by an operator with a mouse in the Diagram Window* and comprise an ordered sequence of states and edges." (Lewis column 4 lines 57-60, emphasis added.)

In particular, the various selection buttons shown in Window 36 of Lewis Figure 3 are used along with the point-and-click device to create the waveforms as follows:

> "To insert a new signal, the operator selects an existing signal above which the new signal will be inserted. The New Signal button is clicked and a Signal Attributes dialog box appears..." (Lewis column 9 lines 21-24.)

Once created, the user specifies where the waveform edges should be located for the newly-created signal, as follows:

> "...the pointer tool is positioned where the operator wants the edge using a hair-line on the ruler face as a reference point. The operator then clicks the left mouse button and the edge is added....To move an edge an operator drags the edge using a pointer tool which then appears as the Edge Move tool." (Lewis column 10 lines 41-44 and column 11 lines 37-38.)

A waveform pulse is created as follows:

> "To insert a pulse into a waveform, the operator positions the pointer tool at the desired location and double clicks the left mouse button". (Lewis column 11 lines 10-12.)

Other functions employed by the user to create the timing diagram are described throughout Lewis.

From the foregoing, it may be appreciated that in Lewis, the user employs a drawing program to manually create the original timing waveforms within the Diagram Window. These waveforms are not created by any program that is interpreting spreadsheet data.

After the timing diagrams are manually created using the above described process, a user of the Lewis system may then utilize a Parameter Spreadsheet to specify data that describes timing relationships between edges in the previously–created timing diagram. This data includes *numbers* that specify MIN/MAX values for delays, constraints, and signal skews. This data further includes formulas to generate a number for one of the foregoing, as well as variables used in the formulas or instead of a constant. This is described in Lewis as follows:

> "The Parameter Spreadsheet 38 is similar to parameter tables in a component data book ...Each row 74 represents a timing parameter, for example, a delay, constraint, signal skew, or variable. The columns within each row 74 define the entry, such as row number 76, and type 78, name 80, formula 82, MIN/MAX 84/86, margin 88 and comment 90." (Lewis column 6 lines 12-19.)

The information from the Parameter Spreadsheet is then used to define relationships between edges of the previously created waveform. For example, a user does the following to specify a delay:

> "...the operator selects the edges involved in the Diagram Window 36, and then specifies, in the Parameter Spreadsheet 38, the MIN/MAX delay time values that the target edge trails the source edge. Once both parts of the delay are in place, then the relative position of the two edges are automatically maintained by the present invention. This means that when the operator moves an edge that is the source or target of the delay, edges associated with that edge also move." (Lewis column 12 lines 41-51.)

Thus, the Parameter Spreadsheet is used to setup relationships between edges so that when a user modifies a waveform within the Diagram Window 36, the relationships are maintained.

From the foregoing, it is apparent that a waveform is ***manually created by a user*** within the Diagram Window. Then, the relative positioning between two edges of the manually-created waveform is defined using parameters (numbers) entered in the Parameter Spreadsheet. It may be noted that the Parameter Spreadsheet ***does not contain any commands*** that are used to actually ***create*** the timing diagram, since the timing diagram is created ***manually by the user***. In fact, this Spreadsheet only contains parameters (numbers), and information describing the parameters (e.g., names and types of the parameters), and does not contain anything that could be interpreted as commands.

Another spreadsheet described as the Library Spreadsheet likewise does not include anything that could be interpreted as actual commands. This spreadsheet is said to "...hold variables only..." (Column 6 line 23.) These variables are those that are used in many designs (Column 7 lines 14-15.), such as delay values that are referenced by the formulas of the Parameter Spreadsheet.

Finally, it may be noted that in Lewis, the Diagram Window 36, the Parameter Spreadsheet 38, and the Library Spreadsheet 40 are different windows *of the same program*. This is described in Lewis as follows:

> "FIG. 2 is a flow chart defining the overall logic of ***the computer program*** which directs the operation *of the present invention*. ***The computer program*** defines a set of states and operations..." (Lewis column 3 lines 62-65, emphasis added.)

This description continues as follows:

> "FIG. 3 illustrates the *three different windows* displayed by *the present invention* on the PC monitor 12: a Diagram Window 36; a Parameter Spreadsheet 38; and a Library Spreadsheet 40..." (Lewis column 4 lines 27-30, emphasis added.)

The same concepts are reiterated as follows:

> "In summary, ***a computer program*** has been described that automates the entry, modification, and verification of timing diagrams for electrical circuits. ***The computer program*** also provides an automated mechanism for analyzing these timing diagrams and verifying the timing relationships specified for the circuit are met using the parts selected for the circuit." (Lewis column 22 lines 53-59, emphasis added.)

Thus, it may be appreciated from the foregoing that the Lewis Diagram Window, Parameter Spreadsheet, and Library Spreadsheet are windows that are supported by the same program. It appears that none of these windows are separate executables that may be executed, or used, apart from the other. That is, the Parameter Spreadsheet does not appear to find any useful purpose apart from the Diagram Window such that a user would choose, or be allowed, to initiate execution of the Parameter Spreadsheet without use of the Diagram Window. This will be discussed further below.

Next, Applicants' invention is considered. In contrast to Lewis, Applicants' invention describes using a spreadsheet that is generated by a spreadsheet program to describe ***all data*** that is needed to draw a timing diagram, including the states of the signal lines, the locations of all edge transitions, maximum and minimum transition times for the edges, content and location of all labels, locations of any signal glitches, positioning of arrows, content and location of headers, and so on. The spreadsheet contains commands that are interpreted to cause the drawing of each of the foregoing aspects of a timing diagram. This is discussed in detail on pages 5-14 of Applicants' Specification. Figures 8A – 8D illustrates an exemplary spreadsheet containing these types of commands, which include the "Cycle", "Rpt", "Options", "Mark", "Label", "Glitch", "OpenBox", "CloseBox", "BeginArrow", and "EndArrow" commands. The spreadsheet further includes data, such as times associated with various segments of a particular waveform, the contents of a label, and so on.

After the spreadsheet is created to include the types of data and commands set forth above, it is provided as input to a control program. This control program

opens a drawing program, and then automatically interprets the commands contained in the previously-created spreadsheet to control the drawing program so that a timing diagram is *automatically* generated. (Applicants' Specification page 4 line 14 – page 5 line 5.) As an example, the commands contained in spreadsheet of Figures 8A-8D are interpreted by the control program and used to cause the drawing program to automatically generate the timing diagrams of Figures 3A and 3B.

According to one aspect of the invention, the spreadsheet program that is used to create the spreadsheet, the control program that is used to interpret the spreadsheet, and the drawing program are all independent programs that are capable of being executed independently of one another. In one embodiment, the spreadsheet program is Microsoft® Excel® and the drawing program is VISIO®.

As may be appreciated from the foregoing discussion, several important distinctions exist between the system of Lewis and that described in Applicants' Specification as follows:

a.) According to Applicants' system and method, a spreadsheet contains ***all information*** needed to generate a timing diagram. This information is interpreted by a control program, which operates in conjunction with a drawing program to *automatically generate* a timing diagram. In contrast, in Lewis, *a user employs* a *drawing program to manually generate* a timing diagram. Parameters and variables contained in several spreadsheets are then used to create relationships between associated edges of the previously-created timing diagram. Thereafter, this defined relationship is maintained between the related edges, even if the user moves one of the edges.

It may be noted that it would be impossible to create a signal waveform or a header solely using the information contained in either or both of the Lewis Spreadsheets. This is because these Spreadsheets do not contain signal levels, edge positions, and so on. Thus, ***Lewis*** most certainly ***does***

not teach a spreadsheet that contains all information needed to generate a ***timing signal*** or a header.

b.) According to Applicants' invention, the spreadsheet contains *actual commands* that are interpreted to automatically generate Applicants' timing diagrams. In contrast, no similar commands are contained in the Lewis spreadsheets, which store only parameters (i.e., numbers), equations to generate these parameters, and variables. In fact, by the time the Lewis parameter and variable information is employed to create relationships between waveform edges, the waveform diagrams have already been *manually generated* by the user. Thus, in Lewis, there is no reason to include commands within the spreadsheets.

c.) As previously described at length in the Prior Response, Applicants' solution is modular. That is, the spread-sheet and drawing programs that are used to implement the solution are independent, and are capable of executing apart from one another. This makes Applicants' system flexible, since any spreadsheet program that best suits a particular user's needs can be paired with a preferred drawing program.

In contrast to Applicant's approach that uses multiple independent programs, Lewis provides *a single program* that includes multiple windows. One window supports the drawing of timing diagrams, another window supports the storing of parameters, and a third window stores variable lists. This use of a *single program* is reiterated throughout the Lewis Specification, as is summarized above. Because Lewis supports use of only *a single program,* a user cannot "mix and match" to select a preferred spreadsheet program for use with an optimal drawing program, as can be done in Applicants' system.

For at least the foregoing reasons, Applicants' invention is not taught or suggested by Lewis. Moreover, it may be noted that nothing in Visio2000 teaches or suggests these aspects described above regarding Applicants' Claimed invention.

Next, the specific language of the Claims is considered in reference to the current rejection. First, Claim 1 is discussed. This Claim has been amended in the suggested amendment set forth above to correct punctuation and formality issues only, and does not raise issues requiring more searching. This Claim describes:

a.) Capturing data from an EXCEL® spreadsheet program data file, wherein said data is organized by lines, and wherein ***a set of lines contains all information needed for producing a single signal line or a header/format line.*** (Claim 1, lines 2-3.)

As previously described, nothing in Lewis even suggests using a set of lines of a spreadsheet that ***includes all information needed to produce a signal line or header format line***. In Lewis, the information needed to produce a signal line or header line is *provided manually* by the user through interaction with the buttons of the GUI interface of Diagram Window 36 shown in Lewis Figure 3. The spreadsheet information is used to create relationships between edges only *after* the signal lines are already created. This conventional *manual* use of a drawing program in Lewis *teaches away* from Applicants' approach of generating signal lines automatically using commands contained in a spreadsheet.

b.) Interpreting ...said set of lines in accord with a *command from within said set of lines*. (Claim 1, lines 10-11.)

As previously stated, there are no "commands" contained within any set of lines of a Lewis spreadsheet. As specifically described in the Lewis Specification quoted above, the Lewis spreadsheets contain only parameters, variables, or equations for generating parameters. These spreadsheets do

not contain any "commands" that may be "interpreted".

For completeness, the Examiner's comments regarding this aspect of the invention are considered. The Examiner cites the contents of the parameter spreadsheet (e.g., "min", "max", "formula", etc.) as teaching Applicants' commands. (See Final Rejection page 9 line 14.) The cited columns of the spreadsheet contain numbers, formula to generate numbers, or information about the numbers (e.g., parameter names and parameter types). These numbers and related information are not "commands" that can be interpreted to generate a waveform.

c.) *Instruct[ing]* an instance of a VISIO® program to draw a signal line or a header/format line *in accord with said command* from within said set of lines (Claim 1 lines 13-14.)

Lewis does not teach instructing a drawing program to draw a signal line in accord with a command in a set of lines, since the signal line is drawn *manually* by the Lewis user via the Diagram Window. Moreover, as noted above, there is no "command" within any set of lines of a Lewis spreadsheet.

Additionally, as already discussed, generation of a waveform requires specification of signal levels, edge positions, and the like. None of this information is contained within the Lewis Parameter or Library Spreadsheets, and therefore these Spreadsheets could not possibly be interpreted in any way that would allow automated generation of a signal line. Lewis does not even suggest adding such information to these Spreadsheets.

Finally, by teaching use of conventional manual methods of obtaining the timing diagrams, Lewis is actually teaching away from Applicants' automated approach described by this element of Claim 1.

d.) operating an instance of a VISIO® program to provide a display file containing each said particular signal line and header/format line *in accord with said captured data interpreted through said command from within said set of lines.* (Claim 1 lines 15-17.)

In Lewis, there is no data that is interpreted through *a command included within a set of lines* of the spreadsheet.

e.) *sending to ...VISIO* ... data parameters corresponding with each said set of lines *together with said command* for each said set of lines so that said instance of VISIO® can produce a .vsd file containing sufficient information for VISIO® to print or display a timing chart having each signal line and header/format line incorporated therein. (Claim 1 lines 19-23.)

In Lewis, the spreadsheets *only* contain parameters and variables, *not commands*. Moreover, in Lewis there is no sending of parameters and commands to a drawing program so that the drawing program can generate a timing chart. As previously stated, in Lewis, the timing charts are manually generated by the user within the Diagram Window 36.

f.) Finally, Claim 1 describes use of a spreadsheet program and a drawing program. (See, for instance, Claim 1 lines 2 and 15.) Applicants' use of these two separate programs is not in any way suggested by Lewis, which teaches a single program with three windows. This is repeated and expressly stated in Lewis. This Lewis approach does not provide the modularity of Applicants' solution for the reasons set forth above.

For at least the foregoing reasons, Lewis does not suggest the invention described by Claim 1. Moreover, nothing in Visio2000 adds anything to Lewis that would suggest the aspects discussed above. For at least these reasons, this rejection is improper, and should be withdrawn. Claim 1 is allowable as currently presented.

The current rejection further rejects Claims 11-15, which depend directly or indirectly from Claim 10. These Claims are allowable for at least the reasons discussed below in regards to Claim 10. (See Section 3, below.)

3. Claims 4, 6, 10, and 16-17 were rejected under 35 USC §102(b) as being anticipated by Lewis. This rejection is respectfully traversed.

Independent Claim 4 includes aspects similar to those discussed above in regards to Claim 1. In particular, Claim 4 recites:

a.) operating a control program for drawing a timing chart from a spreadsheet data file accessible through a spreadsheet program.

As noted above, Lewis does not teach separate control and spreadsheet programs. Moreover, Lewis does not teach drawing a timing chart from a spreadsheet data file, since in Lewis, the timing charts are drawn *manually* by a user from within the Diagram Window. (Claim 4 lines 1-3.)

b.) a spreadsheet employing a drawing program, wherein the spreadsheet program and the drawing program are each capable of executing apart from one another. (Claim 4 lines 4-5.) This wording is used to replace the term "independently operable" pursuant to the Examiner's current rejection under 35 USC §112 discussed above, and is in accordance with the comments of Applicants' Prior Response. As such, this language should not present any issues requiring further searching.

As previously discussed, Lewis does not in any way teach use of both a spreadsheet and a drawing program. The Spreadsheet and Diagram Windows of Lewis are part of *one program*. This is made very clear in the Lewis specification. Thus, these windows are not capable of executing apart from one another as is claimed in amended Claim 4.

c.) the control program captures data from said spreadsheet data file...[and] sends commands based on said captured data to said drawing program, wherein said captured data contains commands for each line of a timing chart. (Claim 4 lines 7-9.)

This limitation is not taught by Lewis for at least the reason that the Lewis spreadsheets do not contain any commands. Moreover, there is no separate control program in Lewis to capture data and commands from a spreadsheet file to send to a different drawing program.

d.) the captured data contains commands for each line of a timing chart. (Claim 4 lines 9-10.)

Nothing in Lewis teaches data that is captured by a control program that contains commands for each line of a timing chart.

e.) the control program interprets said commands for identifying drawing actions to be accomplished by said drawing program and wherein said control program commands said drawing program in conformity with said commands. (Claim 4 lines 11-13.)

Nothing in Lewis teaches a control program that interprets commands (obtained from a spreadsheet) that identify drawing actions. Moreover, Lewis does not teach separate drawing and control programs.

For at least the foregoing, Lewis does not teach each and every element of Applicants' claimed invention, and the rejection under 35 USC §102(b) is improper and should be withdrawn.

Claim 6 depends from Claim 4, and is allowable over this rejection for at least the reasons discussed above in regards to Claim 4. Claim 6 further describes the control program commanding the drawing program in conformity with the commands to produce a display modified by the commands. For reasons similar to those discussed above, these aspects are most certainly not taught by Lewis, and for this additional reason, Claim 6 is allowable over this rejection.

Next, Claim 10 is considered. This Claim includes aspects that are similar to

Claims 1 and 4 discussed above. For instance, Claim 10 describes:

a.) An apparatus for drawing a timing chart based upon data and commands in a spreadsheet data file. (Claim 10 lines 1-2.)

As stated previously, in Lewis, there are no commands in a spreadsheet, and the timing chart is not drawn based on any commands, but rather is drawn manually by a user.

b.) a software program containing a procedure for capturing data and commands from said spreadsheet data file, using a spreadsheet program to access said spreadsheet data file. (Claim 10 lines 3-4.)

In Lewis, there is no software program for capturing commands from a spreadsheet. Moreover, there is not a software program *and* an additional spreadsheet program. The Lewis Specification is very clear that there is only *one* computer *program* that comprises the entire system.

c.) said software program including a set of subroutines for interpreting said commands and a subroutine for sending said interpreted commands to a drawing program together with any associated datums within said data file. (Claim 10 lines 6-9.)

In Lewis, there is no software program that interprets commands, and then sends the interpreted commands to a *different* drawing program.

For at least the foregoing reason, Lewis does not teach each and every aspect of Claim 10, and therefore this rejection under 35 USC §102(b) is improper and should be withdrawn.

Claims 16 and 17 depend from Claim 10 and are allowable over this rejection for at least the reasons discussed above in regards to Claim 10.

Likewise, Claims 11-15, which were rejected under 35 USC §103(a) as being unpatentable based on Lewis in view of Visio2000, depend directly or indirectly from Claim 10. These Claims are allowable over that rejection for at least the reasons discussed above in regards to Claim 10. These Claims further include additional aspects related to using a spreadsheet program and a drawing program to automatically draw timing diagrams from commands obtained from a spreadsheet. These additional aspects are not taught or suggested by any aspects of Lewis or Visio2000, alone or in combination, and these Claims are therefore also allowable because of these additional aspects. The rejection of these Claims as unpatentable based on Lewis in view of Visio2000 is improper, and should be withdrawn.

4. Claims 2-3, and 5 were rejected under 35 USC §103(a) as being unpatentable over Lewis in view of Visio2000, and further in view of U.S. Patent No. 5,983,181 to Yamazaki ("Yamazaki"). This rejection is respectfully traversed.

Claims 2-3 depend from Claim 1, and are allowable for at least the reasons discussed above in regards to Claim 1. Yamazaki adds nothing to Lewis or to Visio2000 to teach the aspects of the method of Claim 1.

Claim 5 depends from independent Claim 4 and is allowable for at least the reasons discussed above in regards to independent Claim 4. Yamazaki adds nothing to Lewis or to Visio2000 to teach the aspects of the method of Claim 4.

5. Claims 7-9 were rejected under 35 USC §103(a) as being unpatentable over Lewis in view of Visio2000, further in view of Yamazaki, and further in view of U.S. Patent No. 5,781,190 to Gorbet et al. ("Gorbet"). This rejection is respectfully traversed.

Claims 7-9 depend from Claim 4 and are allowable for at least the reasons discussed above in regards to Claim 4. These Claims describe additional aspects related to the control program and the spreadsheet program, use of which is not taught by any of the references. These Claims are further allowable over this rejection because of these additional aspects.

Further in regards to this rejection, it may be noted that one skilled in the art would not be motivated to make the cited combination of references. Lewis relates to a program for verification of timing diagrams for electrical circuits. Visio2000 describes operation of the VISIO drawing program. Yamazaki describes a method and apparatus for reading-out/collating a table document which can realize correct collation of a table document. Gorbet describes a system for transferring a slide presentation from a source computer to a destination computer. These references are in vastly unrelated areas of the art, and hence one skilled in the art would not be motivated to take aspects from each of these references to obtain Applicants' invention. For this additional reason, this rejection is improper, and should be withdrawn.

6. The amendment set forth above corrects only typographical errors, and those issues required for clarification purposes by the rejection under 35 USC §112. These amendments do not raise additional issues that require a new search. It is respectfully requested that if this rejection is maintained, these amendments be entered for purposes of appeal.

7. Please find transmitted herewith an Associate Power of Attorney Document.

Conclusion

In the Office Action dated June 6, 2005 which was made **FINAL**, Claims 1-17 were rejected. In the proposed amendment set forth above, Claims 1, 4 and 10 are amended to correct formality issues only, and the remaining Claims remain unchanged. If this rejection is not withdrawn, it is respectfully requested that the amendments to the Claims set forth above be entered for purposes of appeal, since these amendments address formality issues only, and do not raise new issues requiring additional searching. In view of these amendments to the Claims, and the comments set fourth below, it is respectfully submitted that all Claims are now in condition for allowance, and a Notice of Allowance is therefore respectfully requested.

Respectfully submitted,

Beth L. McMahon August 2, 2005
Beth L. McMahon
Attorney for Applicants
Reg. No. 41,987
Tele No. (651) 635-7893